

**Montana Board of Oil and Gas Conservation  
Environmental Assessment**

**Operator:** Continental Resources, Inc.

**Well Name/Number:** Thomas-Bettye HSU

**Location:** SE SE Section 27 T23N R56E

**County:** Richland, **MT; Field (or Wildcat)** W/C (Bakken Horizontal)

**Air Quality**

(possible concerns)

Long drilling time: No, 20 to 30 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick rig to drill a single lateral horizontal Bakken Formation test, 19,720'MD/10,166'TVD.

Possible H<sub>2</sub>S gas production: Slight chance H<sub>2</sub>S gas from Mississippian Formations.

In/near Class I air quality area: No Class I air quality area nearby.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: \_\_\_\_\_

Comments: No special concerns – using triple rig to drill a single lateral horizontal Bakken Formation test, 19,720'MD/10,166'TVD. If there is an existing pipeline for gas in the area, then associated gas can be gathered or if no gathering system nearby gas can be flared under Board Rule 36.22.1220.

**Water Quality**

(possible concerns)

Salt/oil based mud: Yes to intermediate casing string hole to be drilled with oil based invert drilling fluids, (Oil/water 70/20 to 80/20). Horizontal lateral will be drilled with brine water. Surface casing hole will use freshwater and freshwater mud system (Rule 36.22.1001).

High water table: None anticipated.

Surface drainage leads to live water: Yes, nearest drainages are unnamed ephemeral tributary to Fox Creek, about 1/4 of a mile east and about 3/8 of a mile to the northwest from this location. Within this drainage there is a large stock pond, about 5/8 of a mile to the northeast from this location.

Water well contamination: None anticipated, closest water wells are about 5/8 of a mile to the northeast and about 5/8 of a mile to the southeast from this location. Depth of these stock water wells range from 60' to 200'. Surface hole will be drilled with freshwater and freshwater mud system, Rule 36.22.1001. Surface casing will be set at 1930' and steel casing set and cemented to surface from 1930'.

Porous/permeable soils: No, silty-sandy clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

☐ Lined reserve pit

☒ Adequate surface casing

☐ Berms/dykes, re-routed drainage

☒ Closed mud system  
☒ Off-site disposal **liquids (in approved facility)**  
☒ Other: Lined cuttings pit will be used since this is a closed loop mud system to be employed. Cuttings will be disposed of in 16 mil lined pit.

Comments: Require 1930' of surface casing be set to cover the base of the Fox Hills and cemented to surface adequate to protect freshwater zones, Rule 36.22.1001.

### Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No stream crossings required.

High erosion potential: No high erosion potential on this wellsite. This location will require a small cut, up to 6.3' and a small fill, up to 3.5'.

Loss of soil productivity: No, location will be restored after drilling if unproductive. If productive, unused portion of this drilling location will be restored.

Unusually large wellsite: A large wellsite, 400'X450' required.

Damage to improvements: Slight

Conflict with existing land use/values: Slight, surface use appears to be cultivated land.

Mitigation

- ☐ Avoid improvements (topographic tolerance)
- ☐ Exception location requested
- ☒ Stockpile topsoil
- ☐ Stream Crossing Permit (other agency review)
- ☒ Reclaim unused part of wellsite if productive
- ☐ Special construction methods to enhance reclamation
- ☐ Other \_\_\_\_\_

Comments: Access will be over existing county road, #334 and existing lease road. About 556' of new access road will be built into this location off the existing lease road for the Marlys 1-34H. Cuttings will be buried in the lined cuttings pit. Oil based drilling fluids will be recycled. Completion fluids will be hauled to a commercial SWD disposal. The lined cuttings pit will be allowed to dry and then closed by filling and mixing with clay subsoils. Minimum of 4' of cover over the top of the cuttings. No special concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Closest residences are about 1.625 miles to southwest, about 1.75 miles to the northeast and about 2.25 miles to the northwest from this location. The town on Lambert, Montana is about 6 miles to the southwest from this location.

Possibility of H2S: Slight chance from Mississippian Formations.

Size of rig/length of drilling time: Triple drilling rig/short 20 to 30 days drilling time.

Mitigation:

- ☒ Proper BOP equipment
- ☐ Topographic sound barriers
- ☐ H2S contingency and/or evacuation plan
- ☐ Special equipment/procedures requirements
- ☐ Other: \_\_\_\_\_

Comments: Adequate surface casing cemented to surface with an operational BOP stack (annular and double ram rated for 5,000 psig) should mitigate any problems, Rule 36.22.1014.

### **Wildlife/recreation**

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): Fox Lake State Game Management Area, about 6.25 miles to the southwest from this location.

Proximity to recreation sites: Fox Lake State Game Management Area, about 6.25 miles to the southwest from this location.

Creation of new access to wildlife habitat: No new access to wildlife habitat.

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Least Tern, Whooping Crane and Piping Plover.

Candidate species are the Sprague's Pipit and the Greater Sage Grouse. NH tracker website indicates one (1) species of concern, the Whooping Crane.

Mitigation:

☐ Avoidance (topographic tolerance/exception)

☐ Other agency review (DFWP, federal agencies, DSL)

☐ Screening/fencing of pits, drillsite

☐ Other: \_\_\_\_\_

Comments: Private cultivated surface lands. There maybe species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern are discovered at this location.

### **Historical/Cultural/Paleontological**

(possible concerns)

Proximity to known sites None identified.

Mitigation

☐ avoidance (topographic tolerance, location exception)

☐ other agency review (SHPO, DSL, federal agencies)

☐ Other: \_\_\_\_\_

Comments: Private cultivated surface lands. There maybe possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite.

### **Social/Economic**

(possible concerns)

☐ Substantial effect on tax base

☐ Create demand for new governmental services

☐ Population increase or relocation

Comments: Wildcat well. No concerns

### **Remarks or Special Concerns for this site**

No, special concerns for drilling this single lateral horizontal Bakken Formation test, 19,720'MD/10,166'TVD.

### Summary: Evaluation of Impacts and Cumulative effects

No significant long term impacts expected, some short term impacts will occur.

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I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Steven Sasaki  
(title): Chief Field Inspector  
Date: April 9, 2013

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website  
(Name and Agency)

Water wells in Richland County  
(subject discussed)  
April 9, 2013  
(date)

US Fish and Wildlife, Region 6 website  
(Name and Agency)  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES  
MONTANA COUNTIES, Richland County  
(subject discussed)  
April 9, 2013  
(date)

Montana Natural Heritage Program Website  
(Name and Agency)  
Heritage State Rank= S1, S2, S3 T23N R56E  
(subject discussed)  
April 9, 2013  
(date)

Montana Cadastral Website  
(Name and Agency)  
Surface Ownership and surface use Section 27 T23N R56E  
(subject discussed)  
April 9, 2013  
(date)

If location was inspected before permit approval:

Inspection date: \_\_\_\_\_

Inspector: \_\_\_\_\_

Others present during inspection: \_\_\_\_\_